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EXAMINER

SAUNDERS JR, JOSEPH

ART UNIT PAPER NUMBER

2631

DATE MAILED: 09/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



### **DETAILED ACTION**

1. This is the initial office action based on the application filed on December 12, 2004. Claims 1 – 12 are currently pending and considered below.

#### ***Information Disclosure Statement***

2. The information disclosure statement filed December 30, 2004 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

#### ***Drawings***

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 18 of Figures 4 and 5. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement

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Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

4. The disclosure is objected to because of the following informalities: On line 28 of page 1 “at the time” should be changed to “at a time”. Reference character 1 should only refer to one component however it is referred to as both a “mobile phone” and a “terminal” on lines 29 and 31 of page 1 respectively. The acronym W-CDMA on line 7 of page 2 is acceptable however an explicit definition should be provided. On line 10 of page 2 “built-in into” should be corrected. The examiner is unclear as to whether the word “possible” on line 27 of page 2 should be “possible” or “impossible”. On line 9 on page 10 the word “Digit” should be “Digital”. On line 24 of page 24 the word “boars” should be “boards”.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1 and 3 – 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (US 2003/0032443 A1) in view of Romao (EP 1107542 A1).

**Claim 1 and 5:** Johnson discloses a communication terminal comprising; a housing (handset 1 with chassis 9); a user interface (keypad 3, selection key 4, and display 5) on a front side of the housing, said housing carrying therein a radio antenna element (antenna module 11), a PCB comprising a ground plane (ground plane 18 formed by the PCB) extending longitudinally through the terminal behind said user interface; a speaker (speaker 7); and a chamber (cavity 29) that acts as an electromagnetic resonance cavity for the antenna and as an acoustic resonance cavity for the speaker (common or shared antenna or audio cavity); wherein said speaker is mounted inside said chamber, wherein said speaker is placed behind said PCB and completely behind said user interface as viewed from said front side (Paragraphs 24 and 32, Figures 1, 2, and 4), **but does not disclose** wherein sound is coupled from the speaker to a front outlet by means of an opening formed in said PCB at the speaker, a sound channel extending from said opening longitudinally in the terminal between said PCB and said user interface, past said speaker, to a bent portion leading the sound channel around an edge of said user interface at an end portion of the terminal, wherein the sound channel extends from the bent portion to the channel front outlet substantially perpendicular to said front side, wherein said ground plane defines a wall part of the chamber, through which wall part said sound channel front outlet extends. Romao discloses a compact cellular telephone that also comprises a case 1 with a front face 2, a keyboard 5 and

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screen 4 on the front face, inside case 1 is an antenna 11, a printed circuit board 6 extending parallel to the front face, and a loudspeaker 3 along with antenna mounted inside a space between the printed circuit board and the case. Romao further discloses an acoustic volume 8 and an acoustic conduit 9 that connects the loudspeaker to the front face of the case. The acoustic conduit is formed with a bend through an opening over the top of the printed circuit board to a zone located just above the screen where it emerges. Therefore the loudspeaker is coupled acoustically to the outside the case by the acoustic conduit (Paragraphs 12 – 16, Figures 1 – 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a loudspeaker in combination with an acoustic conduit like the one disclosed by Romao in the portable communication device disclosed by Johnson since the acoustic conduit would allow for sound from a speaker placed in the shared antenna/audio cavity to be provided to the front of the phone in a manner that would allow the height of the portable communication device to be reduced since a loudspeaker would not be needed to be positioned above the screen.

**Claim 3:** Johnson and Romao disclose the communication terminal as recited in claim 1, and Johnson further discloses wherein said user interface is a display (display 5) (Paragraph 24, Figures 1, 2, and 4).

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**Claim 4:** Johnson and Romao disclose the communication terminal as recited in claim 1, and Johnson further discloses wherein said user interface is a key pad (keypad 3) (Paragraph 24, Figures 1, 2, and 4).

**Claim 6:** Johnson and Romao disclose the communication terminal as recited in claim 1, and Johnson further discloses wherein said chamber is sealed (cavity 29 is formed, which acts as an audio cavity for the speaker 7, in this case a sealed back volume) (Paragraph 32).

**Claim 7:** Johnson and Romao disclose the communication terminal as recited in claim 1, and Johnson further discloses wherein said chamber has a substantially rectangular box shape (Figure 4).

**Claim 8:** Johnson and Romao disclose the communication terminal as recited in claim 1, and Johnson further discloses wherein said antenna element comprises a substantially flat pattern of conductive material (antenna pattern 15) on a wall of said chamber (Paragraph 32, Figure 4).

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (US 2003/0032443 A1) and Romao (EP 1107542 A1) as applied to claim 1 above, and further in view of Hawker et al. (5,790,679).

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**Claim 2:** Johnson and Romao disclose the communication terminal as recited in claim 1, but do not disclose wherein said sound channel further comprises a channel top outlet extending in a substantially longitudinal direction of the terminal at a top side of said housing. Hawker discloses a communication terminal having a single transducer for handset and handsfree functionality. The transducer 20 is mounted over an opening 34 in partition 28 that divides the enclosure into two chambers 30 and 32 (Column 2 Lines 35 – 41). The front chamber 30 includes ports 40 to provide a clear path for the sound waves from the transducer to the user's ear. The front chamber also includes an acoustic path or conduit, port 44, to the top of the communication terminal. Port 44 exits through the top of the enclosure where it is unlikely to be inadvertently blocked by the user (Column 3 Lines 1 – 8). It would be obvious to one of ordinary skill in the art at the time of the invention to include a port to the top of the communication terminal as disclosed by Hawker to the top of the communication terminal disclosed by Johnson and Romao since doing so would allow for a clear path for sound to travel to the outside of the device improving the audibility in the case that the communication terminal is used in a handset receive mode with the terminal loosely coupled to the users ear (Column 4 Lines 1 – 5).

8. Claims 9 – 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (US 2003/0032443 A1) and Romao (EP 1107542 A1) as applied to claim1 above, and further in view of Teshima et al. (US 6,628,798 B2).



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**Claim 9 – 12:** Johnson and Romao disclose the communication terminal as recited in claim 1, but do not disclose wherein said speaker is configured to convey audio information to a terminal user, wherein said speaker is configured to act as a ringer by transmitting a predetermined sound signal to bring a user's attention to the terminal, wherein said speaker comprises a buzzer configured to act as a ringer by transmitting a predetermined sound signal to bring a user's attention to the terminal, and wherein said speaker is a multi mode actuator configured to act as a ringer and as a vibrator by transmitting predetermined sound signals or vibrations to bring a user's attention to the terminal. Teshima discloses a vibration actuator having three vibration modes for use in a mobile telephone. The first vibration mode mainly vibrates to transmit vibration through the vibration plate to the outside, the second vibration mode mainly vibrates to produce a buzzer sound through the vibration plate, and the third vibration mode produces a sound corresponding to speech through the vibration plate (Column 1 Lines 53 – 65). It would be obvious to one of ordinary skill in the art at the time of the invention to incorporate the vibration actuator of Teshima in the communication terminal disclosed by Romao and Johnson since the vibration actuator of Teshima allows for three modes of operation in single actuator, instead of a separate actuator for each mode, therefore allowing the size of the terminal to be communication reduced (Column 1 Lines 11 – 24).

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- a. Marqvardsen et al. (US 6,922,471 B1) discloses a communication device with shared interior resonance chambers.
- b. Kaikuranta et al. (US 2004/0203997 A1) discloses a mobile communication device with the antenna and speaker carried in a common chamber.
- c. Anderson (US 6,728, 386 B1) discloses a mobile telephone where a volume in the housing is included in the sound path from the transducer to the user's ear.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Saunders whose telephone number is (571) 270-1063. The examiner can normally be reached on Monday - Thursday, 9:00 a.m. - 4:00 p.m., EST.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Myhre can be reached on (571) 270-1065. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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